Top Secret

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DIRECTORATE OF
INTELLIGENCE

Industrial Facilities
(Non-Military)

Basic Imagery Interpretation Report

Lu-ta Petroleum Refinery

Lu-ta, China

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CENTRAL INTELLIGENCE AGENCY
Directorate of Intelligence
Imagery Analysis Service

INSTALLATION OR ACTIVITY NAME		COUNTRY
Lu-ta Petroleum Refinery		CH
UTM COORDINATES	**GEOGRAPHIC COORDINATES**	**WAC-PIC NO** 25X1
51SUD840158	38-58-26N 121-39-15E	0381-18L

MAP REFERENCE

15th RTS. USATC 200, Sheet M0381-10HL, 3rd edition, May 1967, Scale 1:200,000 (SECRET 25X1

LATEST IMAGERY USED	NEGATION DATE (If required)
	Not Required

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ABSTRACT

The Lu-ta Petroleum Refinery is capable of both primary and secondary distillation processes. It was built by the Japanese in 1934, and was expanded to twice its original size from 1948 to the present. When first observed on photography of August 1962, the following major refining units were complete and in operation: a crude distillation unit, a thermal cracking unit, a lubrication oil production area, and two possible light ends units. Between August 1962 and September 1968, a second thermal cracking unit, a possible lubrication oil production area, and a possible reform unit were added, each going into operation upon completion. The refinery reached full operation by September 1968. Its products include straight-run, cracked, and blended gasolines, wax, lubricating oils, diesel and fuel oils, asphalt, kerosene, butanes, butylenes, propanes, and propylenes.

This report includes a detailed line drawing and a photograph of the refinery, mensuration of storage tanks, and a discussion of the status of the facilities in the refinery.

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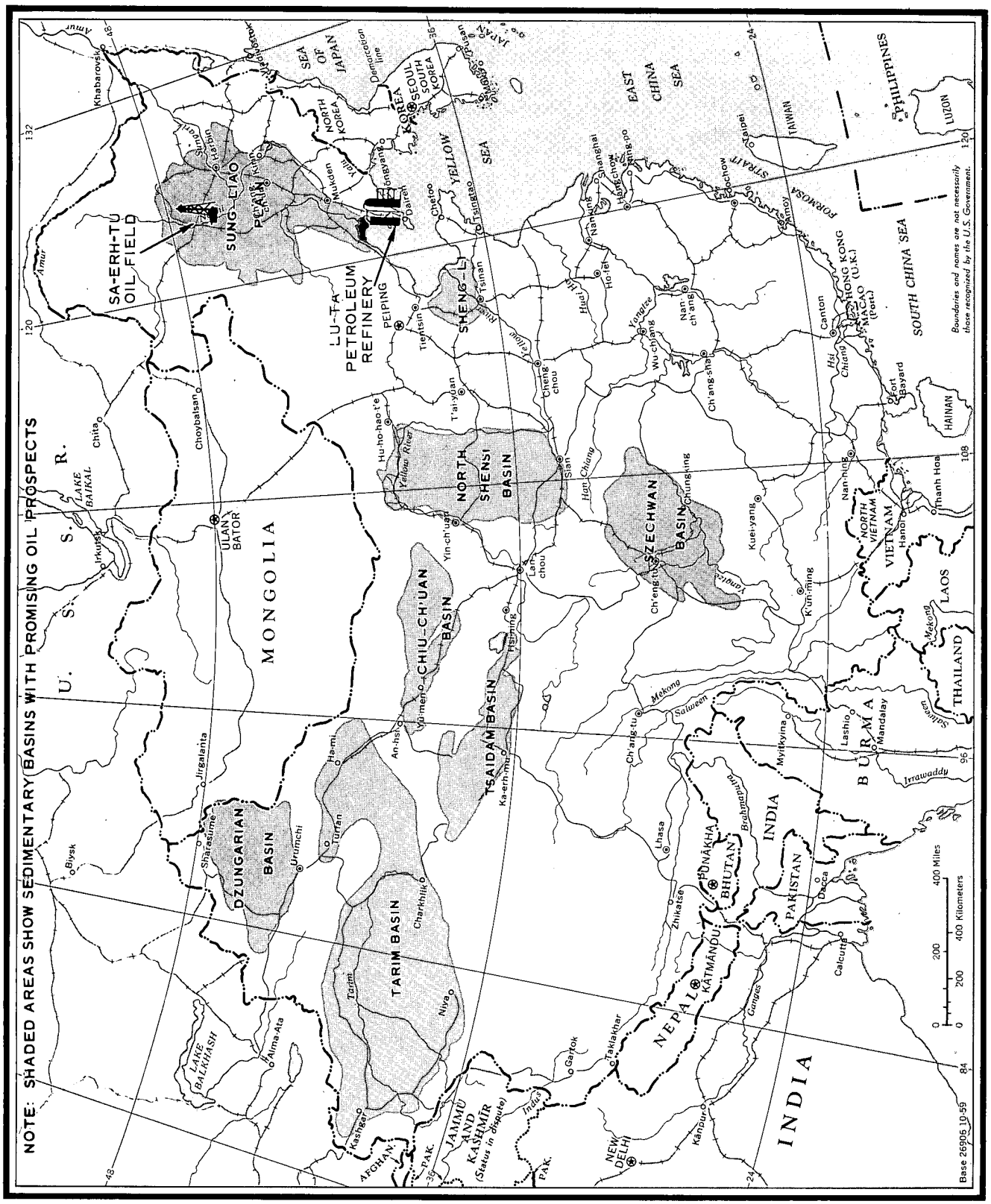

FIGURE 1. LOCATION MAP.

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INTRODUCTION

The Lu-ta Petroleum Refinery is located on the northwest shore of Ta-lien Wan (Bay), approximately 4 nautical miles north of the center of Lu-ta (Dairen) in Liaoning Province. The original refinery, about half the size of the present one, was built by the Japanese in 1934 and was called the Manchuria Petroleum Company. 1/

Before 1960, crude oil for charging the refinery was obtained primarily from Soviet oil fields in the Far East, with Albania and Arabia being secondary sources. After 1960, the supply of Soviet oil decreased and was replaced by crude oil from the Sa-erh-tu Oil Field. This crude oil is transported by rail via Ha-erh-pin to the refinery. The refinery is served by a good road network and a spur from the Lu-ta Railroad Station and Yards, North [redacted] 25X1 and the main rail system.

BASIC DESCRIPTION

Physical Features

The refinery is irregularly shaped, occupying an area which measures approximately 5,500 by 1,800 feet and includes 230 acres. The refinery is partially secured by a wall on the north and west sides and bounded by Ta-lien Wan (Bay) on the remaining sides.

Between June 1965 and January 1966, an attempt was made to camouflage three storage tanks at the refinery.

Operational Function

This refinery is capable of performing both primary and secondary distillation processes. The major refining units and production areas include the crude distillation area, two thermal crackers, two possible light ends units, a reformer, and two lubricating oil production areas. Based on the facilities identified, the products of this refinery are straight-run, cracked, and blended gasolines, wax, lubricating oils, diesel and fuel oils, asphalt, kerosene, butanes, butylenes, propanes, and propylenes. 2/

Construction Status and Activity

When first observed on photography of August 1962, the basic facilities for crude distillation, thermal cracking and the production of lubricating oil and possibly light ends appeared operational. A second lubricating oil production area was in early stages of construction, and approximately 50 percent of the present storage facilities were in place. By May 1966, the

second lubricating oil production area was completed, and some minor changes had occurred at the support and storage facilities.

Between May 1966 and February 1967, one A-frame furnace and two probable A-frame furnaces were added to the thermal cracking area (Figure 3), and a new thermal cracking unit was installed in Area L.

In November 1967 a reforming unit (Area N) was under construction. In September 1968 the reforming unit was complete and a probable shell still (Area P) was being dismantled.

Each new facility was placed in operation upon completion and observed operating on all subsequent photographic missions. All areas of the refinery were complete and in full operation when last observed on photography of September 1968.

Facilities and Equipment

The following table lists the functional areas and equipment within the refinery. All items are keyed to Figure 3.

Summary of Equipment and Facilities
at the Lu-ta Petroleum Refinery

Area	Functional Description	Equipment*
A	Products Storage and Transfer Facilities	29 Storage/support buildings 2 Water basins 1 Overhead loading facility 24 Cylindrical tanks; 6 diam. 85 ft. 2 diam. 70 ft. 1 diam. 65 ft. 1 diam. 60 ft. 2 diam. 30 ft. 8 diam. 20 ft. 4 diam. 15 ft. 1 Tank base
B	Possible By-products	14 Storage/support buildings 7 Cylindrical tanks; 3 diam. 20 ft. 4 diam. 15 ft.

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Area	Functional Description	Equipment*
C	Crude and Products Storage	5 Storage/support buildings 1 Water basin 108 Cylindrical tanks; 1 diam. 140 ft. 4 diam. 120 ft. 1 diam. 105 ft. 1 diam. 85 ft. 4 diam. 80 ft. 3 diam. 75 ft. 2 diam. 70 ft. 1 diam. 60 ft. 1 diam. 55 ft. 8 diam. 50 ft. 7 diam. 45 ft. 6 diam. 40 ft. 11 diam. 30 ft. 10 diam. 25 ft. 45 diam. 20 ft. 3 diam. 10 ft. 1 Tank base
D	Lubricating Oil Production	
	(1) Crude Oil Distillation	1 Vacuum still 1 Atmospheric still 3 Pipe furnaces 1 Bank of accumulators/cooling coils/heat exchangers Miscellaneous processing equipment 3 Support buildings
	(2) Deasphalting	1 Bank processing equipment 4 Processing buildings 2 Support buildings 4 Cylindrical tanks; 3 diam. 25 ft. 1 diam. 15 ft.
	(3) Steam Plant	1 Boilerhouse 2 Cylindrical tanks; diam. 25 ft.

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Area	Functional Description	Equipment*
	(4) Solvent Removal and Dewaxing	1 Chiller and filter building 10 Processing/support buildings 24 Cylindrical tanks; 1 diam. 60 ft. 2 diam. 25 ft. 8 diam. 20 ft. 9 diam. 15 ft. 4 diam. 10 ft. 2 Tank bases
	(5) Clay Treatment	7 Processing/support buildings 13 Cylindrical tanks; 2 diam. 40 ft. 6 diam. 20 ft. 5 diam. 15 ft. 6 Spherical tanks, diam. 20 ft. 5 Horizontal tanks
E	Packing and Shipping	34 Storage/support buildings (one with 1 tank and 2 tank bases on roof. diam. 15 ft.) 13 Cylindrical tanks; 2 diam. 25 ft. 1 diam. 20 ft. 10 diam. 15 ft.
F	Processing and Support	1 Processing building 35 Support buildings 1 Transformer substation 6 Horizontal tanks
G	Water Treatment	1 Probable pumphouse 3 Water basins
H	U/I Processing	1 Bank of processing equipment 3 Columns 1 Water basin 1 Processing building 4 Support buildings 10 Cylindrical tanks; 6 diam. 25 ft. 2 diam. 20 ft. 2 diam. 15 ft. 4 Horizontal tanks

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Area	Functional Description	Equipment*
I	Thermal Cracking	1 Thermal cracking unit 2 Pipe furnaces 2 Probable A-frame furnaces 1 Bank of accumulators/cooling coils/heat exchangers 2 Groups of miscellaneous processing equipment 8 Support buildings (one with four tanks on roof) 2 Water basins 2 Cylindrical tanks; diam. 15 ft.
J	U/I Processing	1 Processing building 7 Support buildings 15 Cylindrical tanks; 1 diam. 20 ft. 14 diam. 10 ft. 2 Horizontal tanks
K	Possible Light Ends	2 Processing buildings 2 Columns 1 Group of miscellaneous processing equipment 4 Support buildings 2 Cylindrical tanks; 1 diam. 25 ft. 1 diam. 10 ft.
L	Thermal Cracking	1 Thermal cracking unit 4 Processing columns (probably a fractionator, two reactors, and a flash tower) 1 Petrochemical/DeFlorez type furnace 1 Support building
M	Crude Oil Distillation	4 Pipe furnaces 1 Atmospheric still 1 Vacuum still 5 Banks of accumulators/cooling coils/heat exchangers 1 Group processing equipment 4 Columns 5 Support buildings

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Area	Functional Description	Equipment*
N	Possible Light Ends and Reforming	4 Fractionators 1 Petrochemical/DeFlorez type furnace 2 Pipe furnaces 2 Accumulators/cooling coils/ heat exchangers 3 Groups of miscellaneous processing equipment 4 Processing buildings 3 Support buildings
O	Support	6 Support buildings
P	Crude Oil Distillation	2 Probable shell stills (1 being dismantled) 1 Overhead loading facility (not shown on drawing) 6 Support buildings 4 Cylindrical tanks; 2 diam. 40 ft. 2 diam. 20 ft.
Q	Possible Lubricating Oil Production	
	(1) Deasphalting	2 Processing columns 1 Petrochemical furnace 1 Processing building 4 Support Buildings 27 Cylindrical tanks; 2 diam. 25 ft. 2 diam. 20 ft. 9 diam. 15 ft. 14 diam. 10 ft.
	(2) Solvent Removal	4 Processing columns Miscellaneous processing equipment 4 Processing buildings (one building with 4 horizontal tanks on roof) 4 Support Buildings 12 Cylindrical tanks; 8 diam. 20 ft. 4 diam. 15 ft. 6 Horizontal tanks
	(3) Dewaxing	1 Processing column 1 Possible chiller and filter building 4 Horizontal tanks

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Area	Functional Description	Equipment*
	(4) Clay Treatment	4 Processing columns 1 Processing building 2 Support buildings 16 Cylindrical tanks; 1 diam. 25 ft. 15 diam. 20 ft.
R	Intermediates and Products Handling and Storage	1 Flare tower 2 Storage/support buildings 48 Cylindrical tanks; 1 diam. 40 ft. 1 diam. 30 ft. 15 diam. 25 ft. 26 diam. 20 ft. 5 diam. 15 ft. 1 Tank base
S	Packing and Shipping	14 Storage/support buildings
T	Support	48 Support buildings 1 Steam plant 1 Water basin 2 Cylindrical tanks; diam. 20 ft.
U	Intermediates and Products Handling and Storage	2 Storage buildings 1 Support building 12 Cylindrical tanks; 1 diam. 50 ft. 11 diam. 30 ft.

*NOTE: All dimensions given have been rounded off to the nearest five feet.

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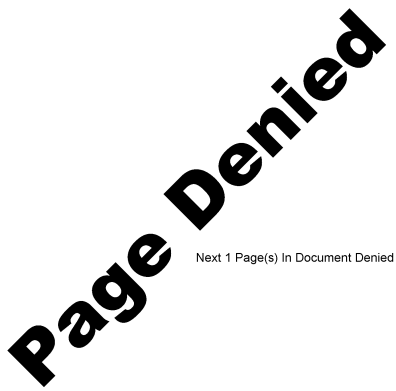

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REFERENCES

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Map

15th RTS. US Air Target Chart, Series 200, Sheet M0381-10HL, 3rd edition, May 67, Scale 1:200,000 (SECRET

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Documents

1. PIR-4/67 Dairen Petroleum Refinery, January 1967 (SECRET

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2. CIA. Dairen Number Seven Refinery, 27 November 1967 (CONFIDENTIAL)

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Requirement

EXSUBCOM - BR-N/002-69

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